

Amendments to Claims

This listing of claims will replace all the prior revisions, and listings of claims in this application.

Listing of Claims

- 1 1. (Original) A method comprising:
2 generating a phase-shift keyed optical signal; and
3 propagating the optical signal through a semiconductor optical amplifier in
4 deep saturation to regulate the amplified optical power.

- 1 2. (Currently amended) The method of claim 1, wherein the amplified optical
2 power is regulated to about the saturation output power of the SOA
3 semiconductor optical amplifier.

- 1 3. (Original) The method of claim 1, wherein the gain recovery time of the optical
2 amplifier is larger than the bit period of the optical signal.

- 1 4. (Original) The method of claim 1, wherein the optical signal has a data-
2 independent intensity profile.

- 1 5. (Original) The method of claim 1 wherein the optical signal is RZ-DPSK signal.

- 1 6. (Original) The method of claim 1, wherein the optical signal is an $\pi/2$ -DPSK
2 signal.

1 7. (Original) The method of claim 1, wherein the optical signal is a constant-
2 intensity DPSK signal.

1 8. (Original) The method of claim 1, wherein the optical signal is an RZ-DQPSK
2 signal.

1 9. (Original) The method of claim 1, wherein $\Delta P_{OUT} \text{ (dB)}/\Delta P_{IN} \text{ (dB)}$ of the optical
2 amplifier is less than about 0.25, wherein P_{OUT} is the power of the optical signal
3 output from the amplifier, and P_{IN} is the power of the optical signal input into the
4 amplifier.

1 10. (Original) A method for optical limiting amplification comprising:
2 propagating a phase-shift keyed optical signal having a data independent
3 intensity profile through a semiconductor optical amplifier such
4 that $\Delta P_{OUT} \text{ (dB)}/\Delta P_{IN} \text{ (dB)}$ is less than about 0.25, to regulate the
5 amplified optical power, where P_{OUT} is the power of the optical
6 signal output from the amplifier, and P_{IN} is the power of the optical
7 signal input into the amplifier.

1 11. (Original) The method of claim 10, wherein the gain recovery time of the
2 optical amplifier is larger than the bit period of the optical signal.

1 12. (Original) The method of claim 10, wherein the optical signal is an RZ-DPSK
2 signal.

1 13. (Original) The method of claim 10, wherein the optical signal is an $\pi/2$ -DPSK
2 signal.

1 14. (Original) The method of claim 10, wherein the optical signal is a constant-
2 intensity DPSK signal.

1 15. (Original) The method of claim 10, wherein the optical signal is an RZ-
2 DQPSK signal.

1 16. (Currently amended) A channel power equalizer comprising:

2 a demultiplexer for demultiplexing an optical signal ~~comprising into~~ a
3 plurality of channels, each said channels having a different optical
4 wavelength;

5 a plurality of semiconductor optical amplifiers optically coupled to the
6 demultiplexer for separately providing optical amplification to the
7 respective ones of the plurality of channels; and

8 a multiplexer coupled to each one of the plurality of semiconductor optical
9 amplifiers, for multiplexing the plurality of optical channels, ~~;~~ and

10 such that each one of the plurality of optical channels in the multiplexed
11 signal has substantially equal optical power.

12 ~~a plurality of semiconductor optical amplifiers optically coupled to the~~
13 ~~demultiplexer and the multiplexer and adapted to provide optical~~
14 ~~power equalization of the plurality of channels.~~

1 17. (Original) An optical signal processor apparatus comprising:

2 a semiconductor optical amplifier device adapted to operate in deep
3 saturation and to receive an RZ-DPSK optical signal having an
4 amplitude-shift keyed optical label portion, such that the optical
5 label portion of the signal is removed upon propagation through
6 the semiconductor optical amplifier device.

1 18. (Currently amended) An optical add/drop multiplexer device comprising:

- 2 a demultiplexer for demultiplexing a multi-channel wavelength-division
3 multiplexed phase shift keyed optical signal into a plurality of
4 optical channels, each said channels having a different optical
5 wavelength;
- 6 a multiplexer having a plurality of input ports, for multiplexing at least one
7 of the plurality of optical channels received from the demultiplexer
8 and at least one added channel; and
- 9 a plurality of semiconductor optical amplifiers optically coupled to each
10 one of input ports of the multiplexer, wherein the plurality of
11 semiconductor optical amplifiers are adapted to separately
12 suppress transient optical power fluctuations in each one of the
13 plurality of the optical channels, and provide optical power
14 equalization between the plurality of optical channels to be
15 multiplexed.

1 19. (Original) An optical communication system for transmitting multi-channel
2 phase-shift keyed optical signals comprising:

- 3 a plurality of semiconductor optical amplifiers,
- 4 wherein the system is adapted to transmit the optical signals such that the
5 plurality of semiconductor optical amplifiers operate in deep
6 saturation so as to provide optical power equalization of a plurality
7 of channels of the multi-channel optical signals.

1 20. (Original) An apparatus comprising:

- 2 a means for generating a phase-shift keyed optical signal; and
- 3 a means for propagating the optical signal through a semiconductor
4 optical amplifier in deep saturation to regulate the amplified optical
5 power.